

REMARKS

By this Amendment, claims 1-7 are cancelled, and claims 8-15 are added. Thus, claims 8-15 are now active in the application. Reexamination and reconsideration of the application are respectfully requested.

The specification and abstract have been carefully reviewed and revised to correct grammatical and idiomatic errors in order to aid the Examiner in further consideration of the application. The amendments to the specification and abstract are incorporated in the attached substitute specification and abstract. No new matter has been added.

Also attached hereto is a marked-up version of the substitute specification and abstract illustrating the changes made to the original specification and abstract.

Initially, the Applicant wishes to thank the Examiner for conducting the telephonic interview with the Applicant's representative on October 30, 2003 with regard to the Examiner's requirement, in item 3 on page 3 of the Office Action, that the Applicant submit a "corrected certified copy" of the foreign priority document of the present application. The present application was erroneously identified by PCT Application No. "PCT/JP99/00645", instead of PCT Application No. PCT/JP99/06645, in the Transmittal Letter filed with the present application on July 31, 2000. The Correction of International Application Number and the second Transmittal Letter filed on September 11, 2000 by the Applicant attempted to correct the PCT Application No. of the present application, but the Notice of Acceptance mailed on September 25, 2000 still identified the present application by the incorrect PCT Application No. As a result of the present application being identified by the incorrect PCT Application No., the Examiner indicated that a copy of the certified copy of Japanese Patent Application No. 10/341,223, the foreign priority document from which priority is claimed in the present application, was not received, which is the reason why the Examiner required a "corrected certified copy" of the foreign priority document. However, the Applicant's representative informed the Examiner that under PCT Rule 17 the Applicant is not required to provide copies of the certified copies of the priority document if the PCT office of the PTO is able to obtain copies thereof from the International Bureau. In the event the Examiner is unable to obtain a copy of the certified copy of

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the foreign priority document, the Examiner is invited to contact the Applicant's representative to obtain such a copy thereof.

In item 2 on page 2 of the Office Action, claims 1-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fumiyasu et al. (JP 07162990 A) in view of Olsson (U.S. 5,913,178). This rejection is believed to be moot in view of the cancellation of claims 1-7. Furthermore, the Applicant respectfully submits that this rejection is inapplicable to new claims 8-15 for the following reasons.

The present invention provides a speaker apparatus comprising an amplifier which is operable to receive an input signal and to output an amplified signal, a speaker unit which is operable to reproduce the amplified signal and to radiate an acoustic output signal, and an acoustic pipe mounted in the front of the speaker unit. The speaker apparatus of the present invention also comprises a microphone disposed in the acoustic pipe, where the microphone is operable to detect the acoustic output signal radiated from the speaker unit, and a feedback circuit which is operable to feed the acoustic output signal detected by the microphone back to an input side of the amplifier.

Since the acoustic output signal is detected by the microphone disposed in the acoustic pipe, the microphone is susceptible to resonance caused by standing waves occurring in the acoustic pipe or by standing waves due to the length of the acoustic pipe. If the microphone detects such resonance generated in the acoustic pipe, the microphone will resultantly feed such resonance back to the amplifier. Conventional speaker apparatuses have been developed where sound absorbing material are disposed on the inner walls of the acoustic pipe and where the microphone is located in front of and close to the speaker unit, but even with such a construction, the microphone still detects acoustic outputs of a second and/or higher resonance generated in the acoustic pipe and a resonance generated in a closed space of the acoustic pipe which is orthogonal to the longitudinal direction of the acoustic pipe. Thus, such resonance detected by the microphone is fed back to the amplifier and is resultantly output by the speaker unit. Furthermore, the cost of the speaker apparatus increases by disposing sound absorbing material on the inner walls of the acoustic pipe even though the incorporation of the sound absorbing

material does not prevent the microphone from detecting the second and/or higher resonance and the resonance generated in the closed space of the acoustic pipe that is orthogonal to the longitudinal direction of the acoustic pipe.

It is therefore an object of the present invention to provide an improved speaker apparatus in which the microphone does not detect a second and/or higher resonance generated in the acoustic pipe and a resonance generated in a closed space of the acoustic pipe which is orthogonal to the longitudinal direction of the acoustic pipe. The present invention, as recited in new claim 8 and as described in lines 6-16 on page 10 of the preliminarily amended original specification and in lines 9-21 on page 8 of the substitute specification, achieves this object by placing the microphone in a position where sound pressure of a resonance occurring in a longitudinal direction, in a latitudinal direction (fb) orthogonal to the longitudinal direction, and in a direction (fc) orthogonal to both the longitudinal direction and the latitudinal direction of the acoustic pipe is low enough so as not to cause oscillation. By the placing the microphone in the desired location, the present invention obviates the need for sound absorbing material, i.e., attenuating material.

In rejecting claims 1, 4 and 6, the Examiner asserted that Fumiyasu et al. discloses the speaker apparatus of the present invention, except that Fumiyasu et al. does not disclose or suggest placing the microphone at a position where sound pressure of at least one of a second and higher pipe resonance of the acoustic pipe is low enough so as not to cause oscillation and/or at a position where sound pressure of resonance occurring in a closed space of the acoustic pipe is low enough so as not cause oscillation. To teach this feature, the Examiner cited Olsson as disclosing that a pipe causes oscillation due to resonant frequencies, and that by placing a microphone at a selected location, the oscillation can be minimized.

As described above, new claim 8 recites that the microphone is placed at a position where sound pressure of a resonance occurring in a longitudinal direction, in a latitudinal direction orthogonal to the longitudinal direction, and in a direction orthogonal to both the longitudinal direction and the latitudinal direction of the acoustic pipe is low enough so as not to cause oscillation. Accordingly, the present invention, as recited in new claim 8, specifically defines the placement of the microphone in a three dimensional direction of the acoustic pipe.

In contrast to the present invention, Olsson merely discloses that, in order to reduce resonant frequencies, the placement of the microphone is $2/3$ of the total length of the sound guide (quarter-wave pipe) 5 (see Column 4, lines 19-23 and 50 and Fig. 2b). Olsson also specifically defines the placement of the microphone in the sound guide two-dimensionally (see Column 5, lines 15-19 and Fig. 2b). The placement of the microphone is defined by $a + b = 2c$, where a is the linear distance from the opening of the cover 3 to the bend of the sound guide 5 disposed in the cover 3, b is the linear distance from the bend of the sound guide 5 to the middle of the microphone 6, and c is the distance from the middle of the microphone 6 to the outer wall of the sound guide 5. Accordingly, Olsson clearly does not disclose or suggest placing the microphone at a position where sound pressure of a resonance occurring in a longitudinal direction, in a latitudinal direction orthogonal to the longitudinal direction, and in a direction orthogonal to both the longitudinal direction and the latitudinal direction of the acoustic pipe is low enough so as not to cause oscillation, as recited in new claim 8.

Therefore, Olsson does not cure the deficiencies of Fumiyasu et al. because Olsson fails to disclose or suggest the placement of the microphone as recited in new claim 8. Accordingly, the Applicant respectfully submits that new claim 8 is clearly patentable over Fumiyasu et al. in view of Olsson.

Because of the clear distinctions discussed above, it is submitted that the teachings of Fumiyasu et al. and Olsson, either individually or in combination, do not meet each and every limitation of new claim 8. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time the present invention was made would not have been motivated to modify Fumiyasu et al. or Olsson in such a manner as to result in, or otherwise render obvious, the present invention as recited in new claim 8. Therefore, it is respectfully submitted that new claim 8, as well as new claims 9-15 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is respectfully solicited.

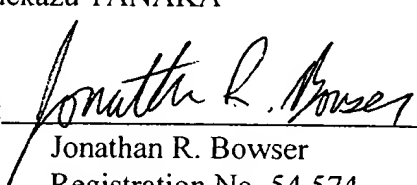
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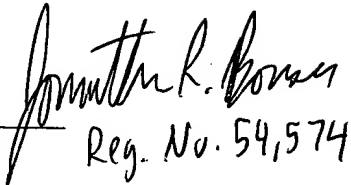
If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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